

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 15378PC OP	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI2004/050085	International filing date (<i>day/month/year</i>) 08.06.2004	Priority date (<i>day/month/year</i>) 25.06.2003
International Patent Classification (IPC) or national classification and IPC C03B 23/03, C03B 35/20		
Applicant Tamglass Ltd Oy et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. (*sent to the applicant and to the International Bureau*) a total of 2 sheets, as follows:
 - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 28.02.2005	Date of completion of this report 13.04.2005
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2004/050085

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- international search (under Rules 12.3 and 23.1(b))
- publication of the international application (under Rule 12.4)
- international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished

the description:

pages 1 - 9 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 11, 12 received by this Authority on 2005.02.28

pages* _____ received by this Authority on _____

the drawings:

pages 1 - 6 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, Nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to the sequence listing (*specify*): _____

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, Nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2004/050085

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1 - 4</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1 - 4</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1 - 4</u>	YES
	Claims	_____	NO

2. Citations and explanations (Rule 70.7)

Amended claims 1-4 were filed on 2005-02-28 together with a statement.

The following documents were cited in the International Search Report:

D1: US5147440 A1
 D2: US5364436 A1
 D3: EP1236692 A2

The cited documents represent the general state of the art. The invention defined in claims 1-4 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed apparatus for bending glass panels. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-4 is novel and is considered to involve an inventive step. The invention is industrially applicable.

Claims

1. An apparatus for bending glass panels, said apparatus comprising
 - an upper mould carriage track (1) with successive mould carriages (9)
 - 5 whose front or rear wall (11) separates successive heating compartments (2, 3) and several successive bending compartments (4a, 4b) from each other, the mould carriages (9) being adapted for an intermittent conveyance towards a press-bending compartment (4b) having its ceiling provided with a descendable and ascendable male mould (22);
 - 10 - a lower mould carriage track (21) with successive mould carriages (9) whose rear or front wall (11) separates successive cooling compartments (5, 6, 7) from each other, the mould carriages being adapted for an intermittent conveyance in a direction opposite to the conveying direction of the mould carriages present on the upper mould carriage track;
 - 15 - a number of bending moulds (12) supported by the mould carriages (9);
 - preheating compartments (2) present in the upstream end of the upper mould carriage track (1), in which the heating of glass panels is effected by means of forced convection for which thermal energy has been obtained from glass panels presently annealing in downstream end
 - 20 compartments (7) of the lower mould carriage track;
 - radiation heating means (13) on the ceiling of preheating compartments (3) at least in some of the preheating compartments;
 - radiation heating means (14) on the ceiling of gravitationally working bending compartments (4a);
 - 25 - an intermediate floor (15a, 15) which separates the bending compartments (4a) and preheating compartments (3, 3a) from compartments (5, 6) therebelow;
 - a lift mechanism (20) for lowering the mould carriages (9) from the upper track (1) onto the lower track (21) together with bent glass panels;
 - 30 the mould carriages (9) being provided with an open-structured or otherwise highly heat transmissive bottom (10), the mould supporting carriage (9)

having its bottom fitted with bearer elements (26) and the press-bending compartment (4b) having its lower section fitted with brace elements (27) for the mould carriage (9), which provide bracing for the bearer elements (26) during a press-bending operation performed by means of the male mould

5 5 (22), and that in connection with the brace elements (27) are provided lifting and lowering mechanisms for the brace elements (27), **characterized** in that the brace elements (27) comprise:

- a frame (28, 29, 30, 31), which has the brace elements (27) arranged in connection therewith and which extends partly beyond the press-bending 10 compartment's (4b) walls;
- power units (32), which are arranged in connection with a frame portion (31) remaining outside the press-bending compartment's (4b) wall and by which the frame (28, 29, 30, 31) is ascendable and descendable.

15 2. An apparatus as set forth in claim 1, **characterized** in that the lifting and lowering mechanism for the brace elements (27) comprises pneumatic or hydraulic cylinders (32).

20 3. An apparatus as set forth in claim 1 or 2, **characterized** in that the mould bearer elements (26) comprise flat bars, rods, tubes or other such beam-like elements fitted to the front and rear edges of the mould carriage's (9) open-structured bottom.

25 4. An apparatus as set forth in any of the preceding claims 1-3, **characterized** in that the frame (28, 29, 30, 31) comprises:

- two elongated girders (28), which are disposed at a distance from each other underneath the bearer elements (26) and whose ends are formed with flanges (29) extending beyond side walls (4c) of the press-bending compartment (4b)
- longitudinal beams (31), each of which is fitted rigidly in a lengthwise direction of the furnace between two successive flanges (29).